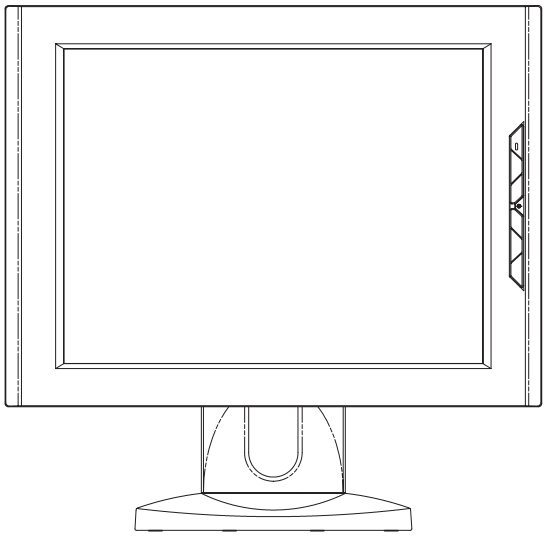
SAMSUNG

TFT-LCD MONITOR

GH15DS

SERVICE Manual

TFT-LCD MONITOR



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1 Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1 Safety Precautions

1-1-1 Warnings

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power and DC Power Jack before servicing.
3. When the chassis is operating, semiconductor heatsinks are potential shock hazards.

1-1-2 Servicing the LCD Monitor

1. When servicing the LCD Monitor, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead. (Disconnect the AC line cord from the AC outlet.)
2. It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

1-1-3 Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check (Figure 1-1):
   WARNING: Do not use an isolation transformer during this test.
   Use a leakage current tester or a metering system that complies with American National Standards Institute (*ANSI C101.1, Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).

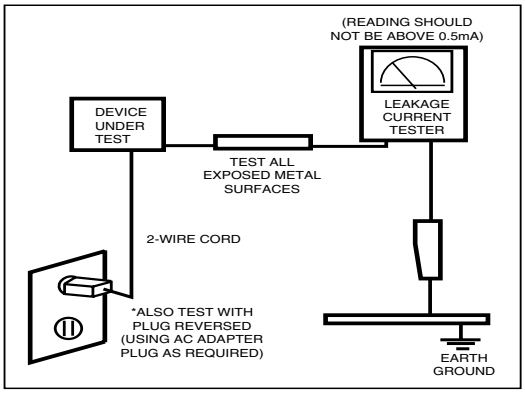


Figure 1-1. Leakage Current Test Circuit

4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

1-1-4 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and / or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2 Servicing Precautions

WARNING: **An electrolytic capacitor installed with the wrong polarity might explode.**

Caution: Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.

Note: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

1-2-1 General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to:
   (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
6. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3 Electrostatically Sensitive Devices (ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution: Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

2 Product Specifications

2-1 Specifications

Item	Description
LCD Panel	TFT-LCD panel, RGB vertical stripe, normaly white,15-Inch viewable, 0.297 mm pixel pitch
Scanning Frequency	Horizontal : 30 kHz ~ 60 kHz Vertical : 56 Hz ~ 75 Hz
Display Colors	16.2 Million colors
Maximum Resolution	Horizontal : 1024 Pixels Vertical : 768 Pixels
Input Video Signal	VESA TMDS
Input Sync Signal	Encoded by TMDS
Maximum Pixel Clock rate	80 MHz
Active Display	Horizontal : 304 mm Vertical : 228 mm
AC power voltage & Frequency	AC 90 ~ 260 Volts, 60/50 Hz ± 3 Hz
Power Consumption	On : 30 W (max) / Saving : 3W (max) / Switch - off : 1W (max)
Dimensions Unit (W x D x H) With Simple Stand Without Simple stand With Pivot Stand Without Pivot Stand	 15.4 x 15.1 x 6.8 Inches (391.4 x 383.6 x 173 mm) 15.4 x 11.5 x 2.5 Inches (391.4 x 292.8 x 64.0 mm) 15.4 x 15.1 x 6.8 Inches (391.4 x 383.6 x 173 mm) 15.4 x 17.1 x 6.8 Inches (391.4 x 433.6 x 173 mm) 15.4 x 11.5 x 2.5 Inches (391.4 x 292.8 x 64.0 mm)
Weight (Net/Gross)	4.2 kg (9.3 lbs) / 5.2 kg (11.5 lbs)
Environmental Considerations	Operating Temperature : 50°F ~ 104°F (10°C ~ 40°C) Humidity : 10 % ~ 80 % Storage Temperature : -3.2°F ~ 140°F (-20°C ~ 60°C) Humidity : 5 % ~ 95 %

- GH15DS comply with SWEDAC (MPR II) recommendations for reduced electromagnetic fields.
- Designs and specifications are subject to change without prior notice.

2-2 DVI Signal Pin Assignments - Main Pin Field (GH15DS)

Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. Data2-	9	T.M.D.S. Data1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data2+	10	T.M.D.S. Data1+	18	T.M.D.S. Data0+
3	T.M.D.S. Data2 Return	11	T.M.D.S. Data1 Return	19	T.M.D.S. Data0 Return
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	DDC Clock	14	+5V Power	22	T.M.D.S. Clock Return
7	DDC Data	15	Ground (Self-Raster)	23	T.M.D.S. Clock+
8	NC	16	Hot Plug Detect (+5V)	24	T.M.D.S. Clock-

2-3 Timing Chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

2-3-1. GH15DS

Table 2-1. Timing Chart

Timing No.	1	2	3	11	17	19
Originator	IBM	IBM	IBM	VESA	VESA	VESA
Mode Name	VGA1	VGA2	VGA3	640/72Hz	640/75Hz	1024/75Hz
Resolution (HxV)	640x350	720x400	640x480	640x480	640x480	1024x768
HORIZONTAL						
Frequency	31.469kHz	31.469kHz	31.469kHz	37.861kHz	37.500kHz	60.023kHz
Total time	31.778μs	31.777μs	31.778μs	26.413μs	26.667μs	16.660μs
Active time	26.058μs	26.058μs	26.058μs	20.825μs	20.317μs	13.003μs
Blank time	5.720μs	5.720μs	5.720μs	5.588μs	6.350μs	3.657μs
Border (L / R)	0.318μs	0.318μs	0.318μs	0.254μs	0.000μs	0.000μs
Data time	25.422μs	25.422μs	25.422μs	20.317μs	20.317μs	13.003μs
Front porch	0.318μs	0.318μs	0.318μs	0.508μs	0.508μs	0.203μs
Sync. width	3.813μs	3.813μs	3.813μs	1.270μs	2.032μs	1.219μs
Back porch	1.589μs	1.589μs	1.589μs	3.810μs	3.810μs	2.235μs
Sync. polarity	Positive	Negative	Negative	Negative	Negative	Positive
VERTICAL						
Frequency	70.086Hz	70.087Hz	59.940Hz	72.809Hz	75.000Hz	75.029Hz
Total time	14.268ms	14.268ms	16.683ms	13.735ms	13.333ms	13.328ms
Active time	11.504ms	13.155ms	15.761ms	13.100ms	12.800ms	12.795ms
Blank time	2.764ms	1.113ms	0.922ms	0.635ms	0.533ms	0.533ms
Border (T / B)	0.191ms	0.222ms	0.254ms	0.211ms	0.000ms	0.000ms
Data time	11.122ms	12.711ms	15.253ms	12.678ms	12.800ms	12.795ms
Front porch	0.985ms	0.191ms	0.064ms	0.026ms	0.027ms	0.017ms
Sync. width	0.064ms	0.064ms	0.064ms	0.079ms	0.080ms	0.050ms
Back porch	1.716ms	0.858ms	0.794ms	0.528ms	0.427ms	0.466ms
Sync. polarity	Negative	Positive	Negative	Negative	Negative	Positive
Dot Clock	25.175MHz	28.322MHz	25.175MHz	31.500MHz	31.500MHz	78.750MHz
Sync. Type	Separate	Separate	Separate	Separate	Separate	Separate
Scan Type*	N/I	N/I	N/I	N/I	N/I	N/I

Table 2-2. Timing Chart

Timing No. Originator Mode Name Resolution (HxV)	12 VESA 800/56Hz 800x600	13 VESA 800/60Hz 800x600	14 VESA 800/72Hz 800x600	18 VESA 800/75Hz 800x600	16 VESA 1024/70Hz 1024x768
HORIZONTAL Frequency Total time Active time Blank time Border (L / R) Data time Front porch Sync. width Back porch Sync. polarity	 35.156kHz 28.444μs 22.222μs 6.222μs 0.000μs 22.222μs 0.667μs 2.000μs 3.556μs Positive or Negative	 37.879kHz 26.400μs 20.000μs 6.400μs 0.000μs 20.000μs 1.000μs 3.200μs 2.200μs Positive	 48.077kHz 20.800μs 16.000μs 4.800μs 0.000μs 16.000μs 1.120μs 2.400μs 1.280μs Positive	 46.875kHz 21.333μs 16.162μs 5.171μs 0.000μs 16.162μs 0.323μs 1.616μs 3.232μs Positive	 56.476kHz 17.707μs 13.653μs 4.054μs 0.000μs 13.653μs 0.320μs 1.813μs 1.920μs Negative
VERTICAL Frequency Total time Active time Blank time Border (T / B) Data time Front porch Sync. width Back porch Sync. polarity	 56.250Hz 17.778ms 17.067ms 0.711ms 0.000ms 17.067ms 0.028ms 0.057ms 0.626ms Positive or Negative	 60.317Hz 16.579ms 15.840ms 0.739ms 0.000ms 15.840ms 0.026ms 0.106ms 0.607ms Positive	 72.188Hz 13.853ms 12.480ms 1.373ms 0.000ms 12.480ms 0.770ms 0.125ms 0.478ms Positive	 75.000Hz 13.333ms 12.800ms 0.533ms 0.000ms 12.800ms 0.021ms 0.064ms 0.448ms Positive	 70.069Hz 14.272ms 13.599ms 0.673ms 0.000ms 13.599ms 0.053ms 0.106ms 0.513ms Negative
Dot Clock	36.000MHz	40.000MHz	50.000MHz	49.500MHz	75.000MHz
Sync. Type	Separate	Separate	Separate	Separate	Separate
Scan Type*	N/I	N/I	N/I	N/I	N/I

3 Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the GH15DS monitor.

WARNING: This monitor contains electrostatically sensitive devices. Use with caution when handling these components.

3-1 Disassembly

Cautions: 1. Disconnect the monitor from the power source before disassembly.
2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.

3-1-1 Removing the Stand

1. Remove 4 screws in the hinge area.
2. Disconnect Power Cord and Signal Cable.
3. Pry it off the back of the monitor.

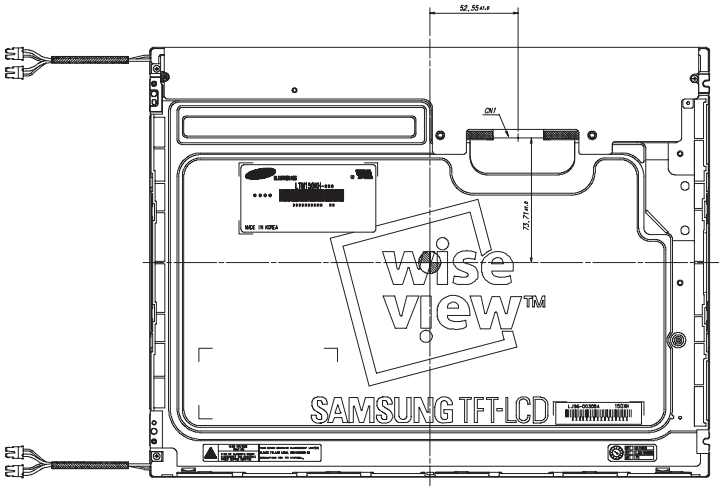
3-1-2 Main Body Disassembly

1. Remove 2 screws on the two corner of the Rear Cover.
2. Remove Rear Cover from the Front Cover.
3. Remove 4 screws on the Shield and remove the shield.
4. Disconnect Inverter wire, Function PCB wire and Interface wire.
   Remove 3 screws on the Main PCB and remove 2 screws on the D sub shield.
5. Remove 3 screws on the power PCB and remove 2 screws on the Inverter PCB.
6. Remove the Main PCB Assembly.
7. Remove 3 screws on the Function PCB from locking area of Function knob and remove Function PCB.

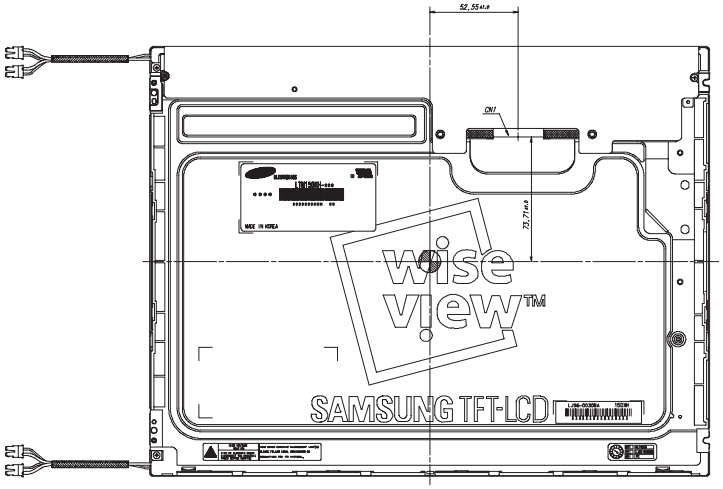
3-1-3 Standard Stand Disassembly

1. Remove 2 screws from the Stand front.
2. Remove 7 screws from the Stand Bottom.
3. Remove Stand Rear from the Stand assembly.
4. Remove 5 screws from the Stand assembly.
5. Remove the Neck front from the Stand assembly.
6. Remove 2 screws from the Stand assembly.
7. Remove Neck Rear from the Stand assembly.
8. Remove 4 screws from the Stand assembly.

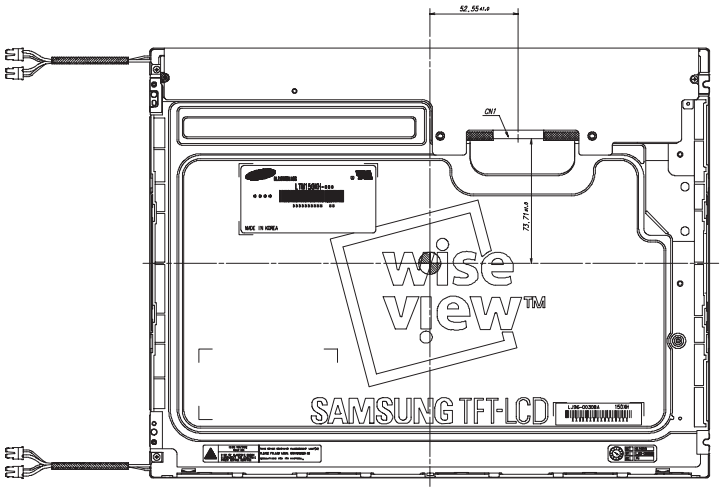
3-2 Replacement Order of Lamp Assemblies (GH15DS : Samsung Panel)



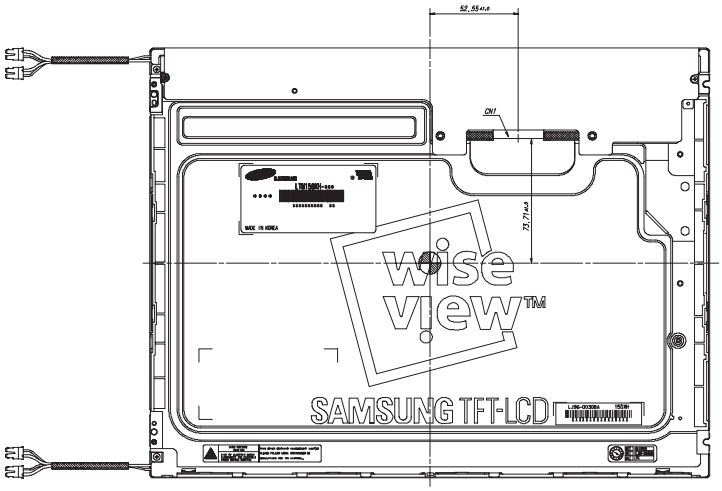
1. After confirm there is nothing on the disk
   Turn the LCD module over and put it on a flat desk set to the ground.



2. Push down the stopper and slide the lamp unit.



3. Please take out the lamp unit from the LCD module.



4. Please fix the new lamp units on the LCD module : opposite process 2 and 3

* Replacement of lamp unit should be done at the power off state and recommanded clean bench condition.

3-3 Reassembly

Reassembly procedures are in the reverse order of Disassembly procedures.

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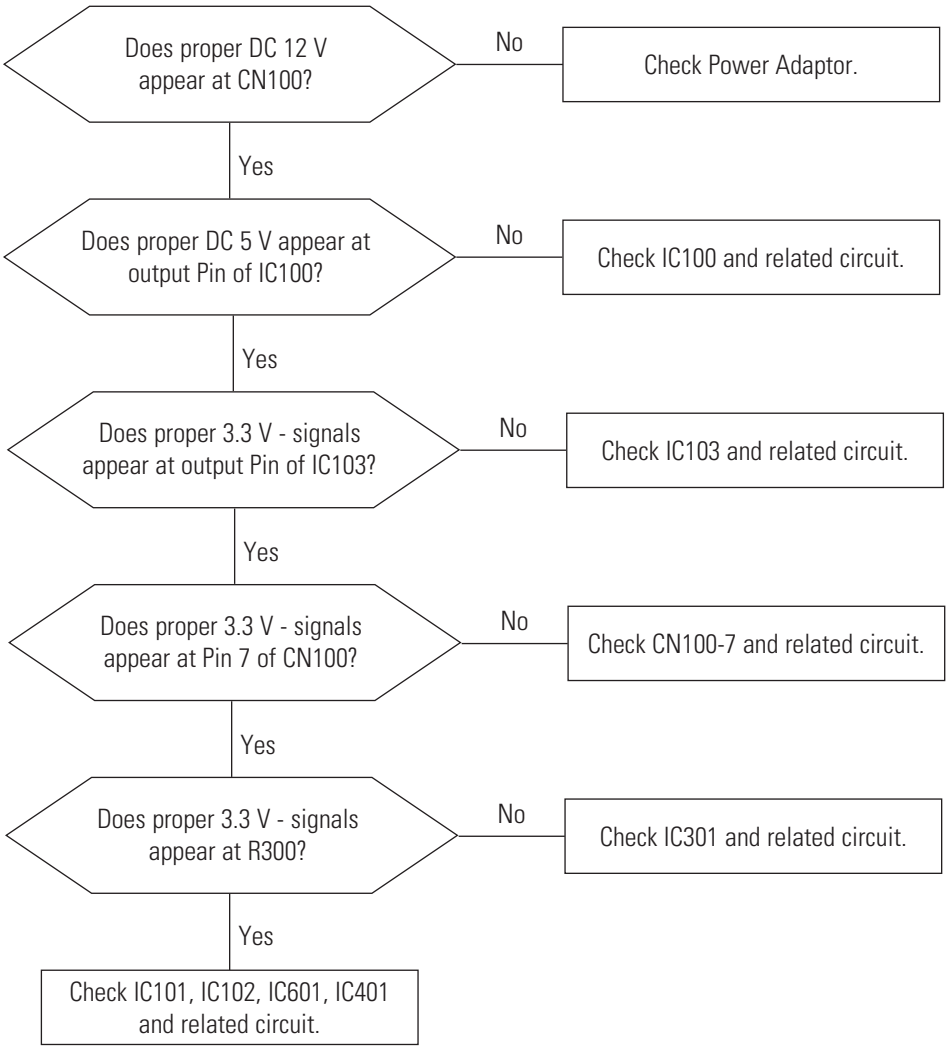
4 Troubleshooting

Notes: 1. Before troubleshooting, setup the PC's display as below.
- Resolution: 1024 x 768
- H-frequency: 48 kHz
- V-frequency: 60 Hz

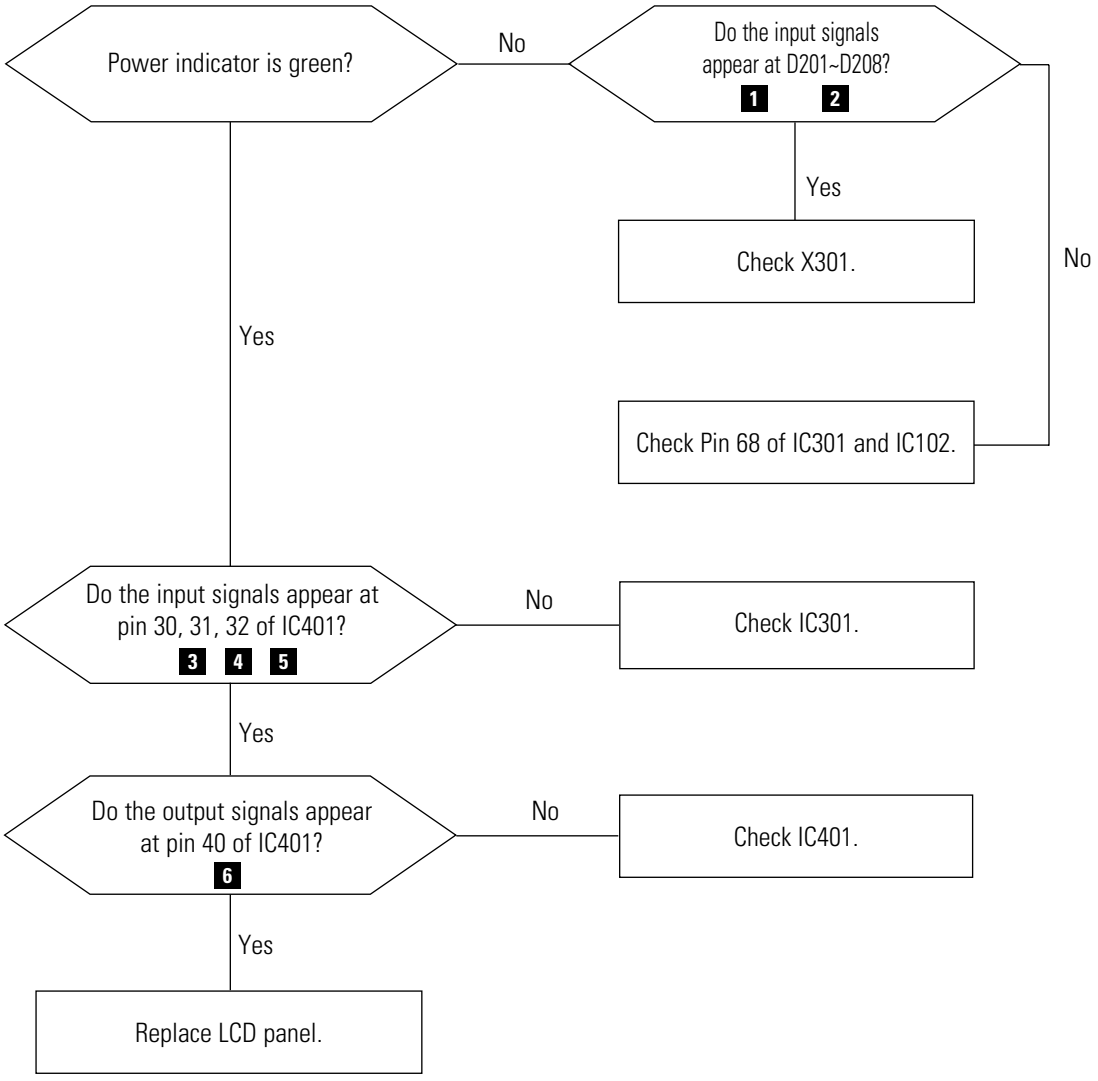
2. If no picture appears, make sure the power cord is correctly connected.
3. Check the following circuits.
- No raster appears: Main PCB
- 12V develop but no screen: Main PCB
- 12V does not develop: Main PCB

4. If you push and hold the EXIT button for more than 5 seconds, the monitor automatically turns back to the factory preset(GH15DS).

4-1 Power

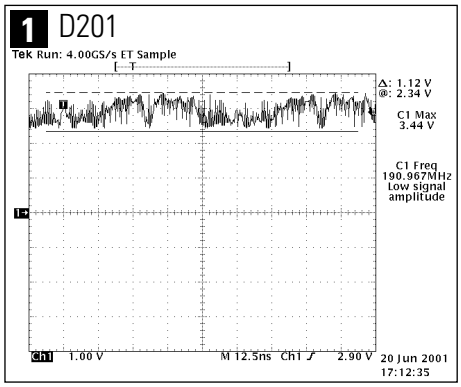

Does proper DC 12 V appear at CN100?
No
Check Power Adaptor.
Yes
Does proper DC 5 V appear at output Pin of IC100?
No
Check IC100 and related circuit.
Yes
Does proper 3.3 V - signals appear at output Pin of IC103?
No
Check IC103 and related circuit.
Yes
Does proper 3.3 V - signals appear at Pin 7 of CN100?
No
Check CN100-7 and related circuit.
Yes
Does proper 3.3 V - signals appear at R300?
No
Check IC301 and related circuit.
Yes
Check IC101, IC102, IC601, IC401 and related circuit.

4-2 Video

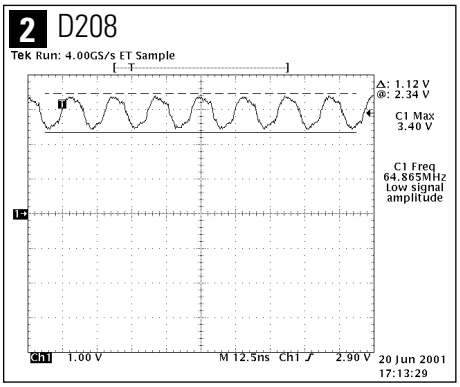

Power indicator is green?
No
Do the input signals appear at D201~D208?
1 2
Yes
Check X301.
No
Yes
Check Pin 68 of IC301 and IC102.
Do the input signals appear at pin 30, 31, 32 of IC401?
3 4 5
No
Check IC301.
Yes
Do the output signals appear at pin 40 of IC401?
6
No
Check IC401.
Yes
Replace LCD panel.

WAVEFORMS

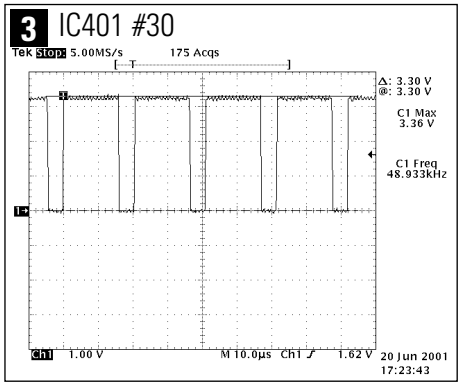
1 D201



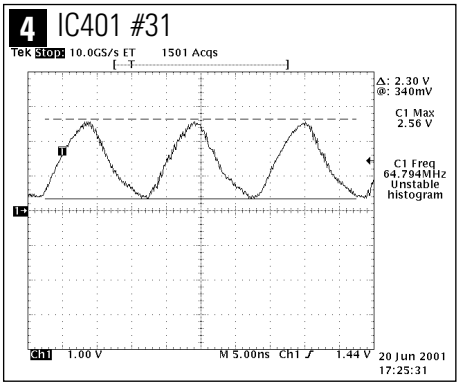
2 D208



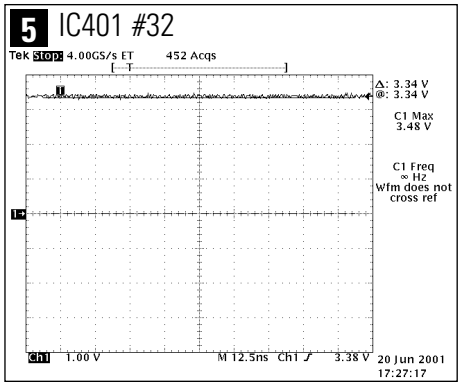
3 IC401 #30



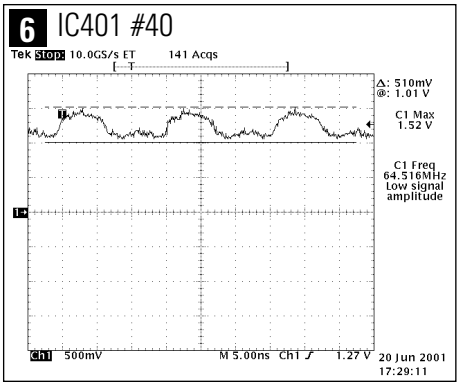
4 IC401 #31



5 IC401 #32



6 IC401 #40



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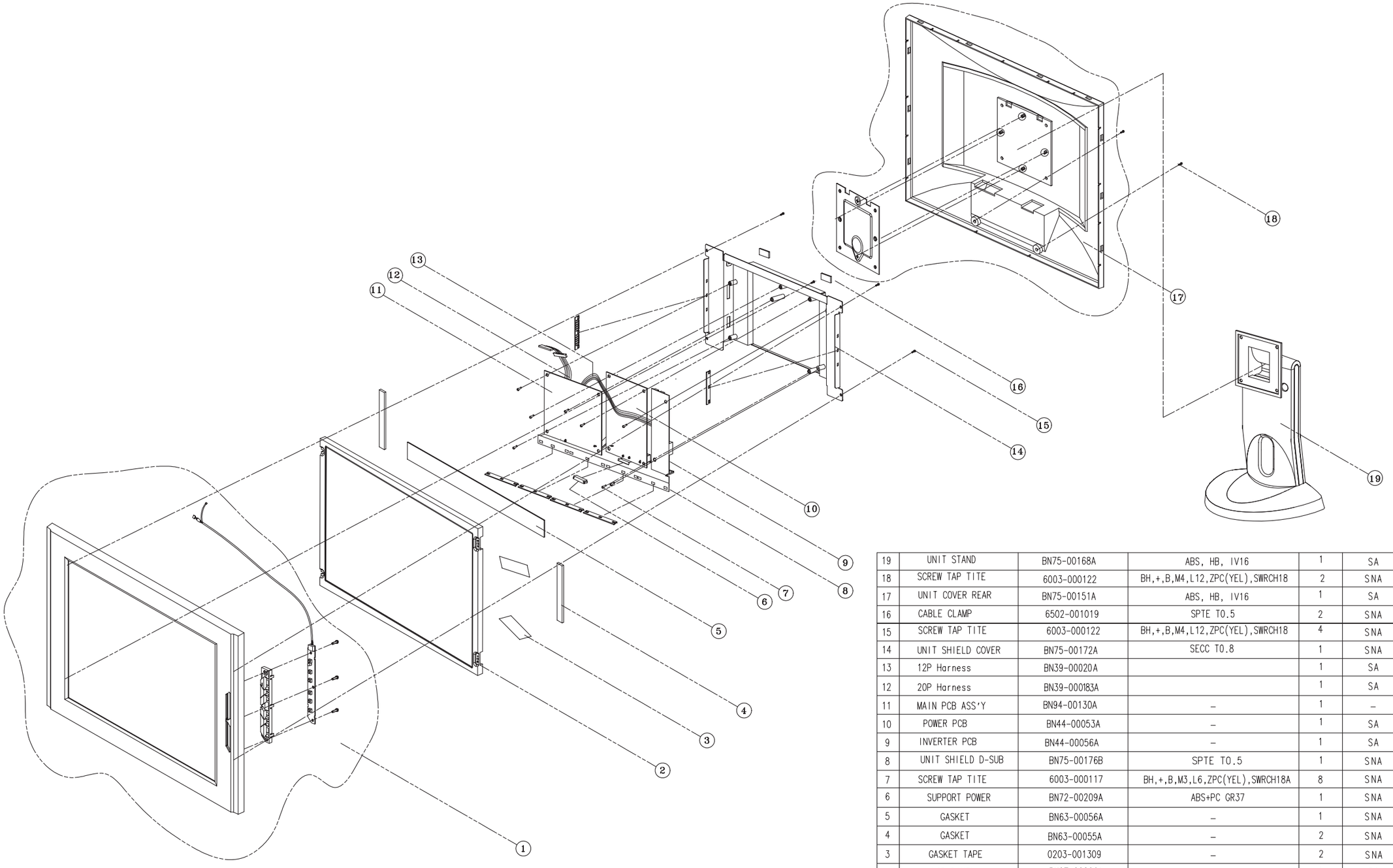
5 Exploded View and Parts List



NO	DESCRIPTION	PART CODE-NO	SPECIFICATION	Q'TY	REMARK
19	UNIT STAND	BN75-00168A	ABS, HB, IV16	1	SA
18	SCREW TAP TITE	6003-000122	BH,+,B,M4,L12,ZPC(YEL),SWRCH18	2	SNA
17	UNIT COVER REAR	BN75-00151A	ABS, HB, IV16	1	SA
16	CABLE CLAMP	6502-001019	SPTE T0.5	2	SNA
15	SCREW TAP TITE	6003-000122	BH,+,B,M4,L12,ZPC(YEL),SWRCH18	4	SNA
14	UNIT SHIELD COVER	BN75-00172A	SECC T0.8	1	SNA
13	12P Harness	BN39-00020A		1	SA
12	20P Harness	BN39-000183A		1	SA
11	MAIN PCB ASS'Y	BN94-00130A	–	1	–
10	POWER PCB	BN44-00053A	–	1	SA
9	INVERTER PCB	BN44-00056A	–	1	SA
8	UNIT SHIELD D-SUB	BN75-00176B	SPTE T0.5	1	SNA
7	SCREW TAP TITE	6003-000117	BH,+,B,M3,L6,ZPC(YEL),SWRCH18A	8	SNA
6	SUPPORT POWER	BN72-00209A	ABS+PC GR37	1	SNA
5	GASKET	BN63-00056A	–	1	SNA
4	GASKET	BN63-00055A	–	2	SNA
3	GASKET TAPE	0203-001309	–	2	SNA
2	LCD PANEL	BN07-00026A	–	1	SA
1	UNIT COVER FRONT	BN75-00149B	ABS, HB, IV16	1	SA

UNIT PART LIST

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6 Electrical Parts List

6-1 Main PCB Part

Loc. No.	Code No.	Description	Specification	Remarks
CIS	BN44-00053A	ADAPTOR	DPA30L,150S,100-240VAC,47 - 63 HZ,12VDC/3.3VDC,2A/2A,-,30.6,AC-DC,-10~40C,-,-	
CIS	BN72-00209A	SUPPORT-POWER	GH15LS,ABS+PC,GR37,-,5V,-,-,-	SNA
CIS	BN75-00176B	UNIT-SHIELD/DSUB	GH15LS,-,SPTE T0.5,-,-,-,-	SNA
CIS	BN70-00204B	SHIELD-D/SUB	GH15DS,SPTE,-,T0.5,-,-,-	
CIS	BN71-00024A	EARTH-PLATE	GH17LS,SUS,T0.15,-,-,-	SNA
CIS	BN46-00008K	MICOM-S/W,GOGH	GH15DS,-,-,-,-,-,-	SNA
CN100	3711-004853	CONNECTOR-HEADER	BOX,7P,1R,2MM,ANGLE,SN,WHT	SNA
CN201	3701-001173	CONNECTOR-DSUB	24P,3R,FEMALE,ANGLE,AUF	
CN601	3711-001465	CONNECTOR-HEADER	NOWALL,3P,1R,2.54mm,STRAIGHT,A	SNA
DVI	BN60-00001A	SCREW-CHASSIS	-,NI PLATING,-,11,HEX,HEX,-,UNC#4-40,NI PLT,-	SNA
IC601	0903-001143	IC-MICROCONTROLLER	88P6232,8BITBit,SDIP,42P,600MIL,12MHz,ST,CMOS,PLASTIC,5V,-,-40to+85C,464BYTE,32K	SNA
SOCK_IC601	3704-001071	SOCKET-IC	42P,DIP,SN,1.778mm	
C102	2402-000176	C-AL,SMD	10uF,20%,16V,GP,TP,4.3x4.3x5.4	
C103	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C104	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C105	2402-001042	C-AL,SMD	100uF,20%,16V,GP,TP,6.6x6.6x5.4mm	
C106	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C107	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C108	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C112	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C113	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C114	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C115	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C201	2402-000176	C-AL,SMD	10uF,20%,16V,GP,TP,4.3x4.3x5.4	
C202	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C301	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C302	2402-001042	C-AL,SMD	100uF,20%,16V,GP,TP,6.6x6.6x5.4mm	
C303	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C304	2402-001042	C-AL,SMD	100uF,20%,16V,GP,TP,6.6x6.6x5.4mm	
C307	2402-000135	C-AL,SMD	22uF,20%,16V,GP,TP,5.3x5.3x5.4	
C308	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C309	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C310	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C311	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C312	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C313	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C314	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C315	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C316	2203-000384	C-CERAMIC,CHIP	0.015nF,5%,50V,NP0,TP,1608	
C317	2203-000384	C-CERAMIC,CHIP	0.015nF,5%,50V,NP0,TP,1608	
C318	2203-000384	C-CERAMIC,CHIP	0.015nF,5%,50V,NP0,TP,1608	
C319	2203-000384	C-CERAMIC,CHIP	0.015nF,5%,50V,NP0,TP,1608	
C320	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C321	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C322	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C323	2402-000135	C-AL,SMD	22uF,20%,16V,GP,TP,5.3x5.3x5.4	
C325	2402-000135	C-AL,SMD	22uF,20%,16V,GP,TP,5.3x5.3x5.4	
C326	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C327	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	

Loc. No.	Code No.	Description	Specification	Remarks
C328	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C329	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C330	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C331	2402-000135	C-AL,SMD	22uF,20%,16V,GP,TP,5.3x5.3x5.4	
C332	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C333	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C334	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C335	2203-000280	C-CERAMIC,CHIP	0.01nF,0.5pF,50V,NP0,TP,1608	
C336	2203-000280	C-CERAMIC,CHIP	0.01nF,0.5pF,50V,NP0,TP,1608	
C402	2203-000440	C-CERAMIC,CHIP	1nF,10%,50V,X7R,TP,1608,-	
C403	2203-000440	C-CERAMIC,CHIP	1nF,10%,50V,X7R,TP,1608,-	
C404	2203-000440	C-CERAMIC,CHIP	1nF,10%,50V,X7R,TP,1608,-	
C405	2203-000440	C-CERAMIC,CHIP	1nF,10%,50V,X7R,TP,1608,-	
C413	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C414	2402-001042	C-AL,SMD	100uF,20%,16V,GP,TP,6.6x6.6x5.4mm	
C415	2402-000176	C-AL,SMD	10uF,20%,16V,GP,TP,4.3x4.3x5.4	
C600	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C601	2402-001042	C-AL,SMD	100uF,20%,16V,GP,TP,6.6x6.6x5.4mm	
C602	2203-000626	C-CERAMIC,CHIP	0.022nF,5%,50V,NP0,TP,1608	
C603	2203-000626	C-CERAMIC,CHIP	0.022nF,5%,50V,NP0,TP,1608	
C604	2402-000176	C-AL,SMD	10uF,20%,16V,GP,TP,4.3x4.3x5.4	
C605	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C606	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C610	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C611	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C612	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C613	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C614	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
CA301	2503-001019	C-NETWORK	33PFX4,10%,50V,CHIP	
CA302	2503-001019	C-NETWORK	33PFX4,10%,50V,CHIP	
CA303	2503-001019	C-NETWORK	33PFX4,10%,50V,CHIP	
CA304	2503-001019	C-NETWORK	33PFX4,10%,50V,CHIP	
CA305	2503-001019	C-NETWORK	33PFX4,10%,50V,CHIP	
CA306	2503-001019	C-NETWORK	33PFX4,10%,50V,CHIP	
CN101	3711-000556	CONNECTOR-HEADER	BOX,12P,1R,1.25mm,SMD-A,SN	SNA
CN402	3711-003161	CONNECTOR-HEADER	BOX,20P,1R,1.25mm,ANGLE,SN	SNA
CN600	3711-002049	CONNECTOR-HEADER	BOX,6P,1R,1.25mm,SMD-A,SN	SNA
D201	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D202	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D203	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D204	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D205	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D206	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D207	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D208	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D209	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D210	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
FT301	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT302	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT303	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT402	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	

Loc. No.	Code No.	Description	Specification	Remarks
FT407	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
IC100	1203-001488	IC-POSI.FIXED REG.	7805,TO-252,3P,-,PLASTIC,4.8/5	
IC103	1203-001293	IC-POSI.FIXED REG.	033,TO-252,3P,6.5MIL,PLASTIC,3	
IC201	1103-000129	IC-EEPROM	24C02,256x8BIT,SOP,8P,150MIL,1	
IC301	1003-001374	IC-LCD CONTROLLER	GM3020,LQFP,128P,551MIL,SINGLE,-,-,PLASTIC,3.47V,0TO+70C,-,-,-	
IC401	1205-001740	IC-TRANSMITTER	DS90C385,TSSOP,56P,240MIL,PLASTIC,4V,1.63W,-10 TO +70C,ST,FPD LINK-85MHZ(LVDS)	
IC603	1103-000129	IC-EEPROM	24C02,256x8BIT,SOP,8P,150MIL,1	
L100	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L101	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L102	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L201	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L303	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L304	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L401	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L402	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L602	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L603	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L604	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L605	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
L606	2703-001334	INDUCTOR-SMD	1.5uH,10%,2x1.25x0.85mm	
MP1.0	BN41-00093A	PCB MAIN	S/M150DS,FR4,2L,-,-,120*110*1.6,GH15D,-,-,-	
Q101	0501-002080	TR-SMALL SIGNAL	2SC2412K,NPN,200mW,SC-59,TP,120-270	
Q102	0501-002080	TR-SMALL SIGNAL	2SC2412K,NPN,200mW,SC-59,TP,120-270	
Q103	0501-002080	TR-SMALL SIGNAL	2SC2412K,NPN,200mW,SC-59,TP,120-270	
Q600	0501-002080	TR-SMALL SIGNAL	2SC2412K,NPN,200mW,SC-59,TP,120-270	
Q601	0501-002080	TR-SMALL SIGNAL	2SC2412K,NPN,200mW,SC-59,TP,120-270	
Q602	0501-002080	TR-SMALL SIGNAL	2SC2412K,NPN,200mW,SC-59,TP,120-270	
Q603	0501-002080	TR-SMALL SIGNAL	2SC2412K,NPN,200mW,SC-59,TP,120-270	
Q605	0501-002080	TR-SMALL SIGNAL	2SC2412K,NPN,200mW,SC-59,TP,120-270	
Q606	0501-002080	TR-SMALL SIGNAL	2SC2412K,NPN,200mW,SC-59,TP,120-270	
R100	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R101	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R102	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R103	2007-000102	R-CHIP	100Kohm,5%,1/16W,DA,TP,1608	
R104	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R105	2007-000102	R-CHIP	100Kohm,5%,1/16W,DA,TP,1608	
R106	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R107	2007-000102	R-CHIP	100Kohm,5%,1/16W,DA,TP,1608	
R108	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R109	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R110	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R111	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R112	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R113	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R114	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R201	2007-000078	R-CHIP	1Kohm,5%,1/16W,DA,TP,1608	
R202	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R203	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R204	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R205	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R300	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	

Loc. No.	Code No.	Description	Specification	Remarks
R301	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R302	2007-000071	R-CHIP	22ohm,5%,1/16W,DA,TP,1608	
R303	2007-000071	R-CHIP	22ohm,5%,1/16W,DA,TP,1608	
R304	2007-000071	R-CHIP	22ohm,5%,1/16W,DA,TP,1608	
R309	2007-000071	R-CHIP	22ohm,5%,1/16W,DA,TP,1608	
R310	2007-000078	R-CHIP	1Kohm,5%,1/16W,DA,TP,1608	
R311	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R312	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R313	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R314	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R315	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R316	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R317	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R318	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R322	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R323	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R324	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R327	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R329	2007-000078	R-CHIP	1Kohm,5%,1/16W,DA,TP,1608	
R330	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R331	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R332	2007-000109	R-CHIP	1Mohm,5%,1/16W,DA,TP,1608	
R401	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R402	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R403	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R600	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R601	2007-000078	R-CHIP	1Kohm,5%,1/16W,DA,TP,1608	
R602	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R606	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R608	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R609	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R610	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R611	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R612	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R613	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R614	2007-000109	R-CHIP	1Mohm,5%,1/16W,DA,TP,1608	
R615	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R616	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R618	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R619	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R620	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R621	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R622	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R623	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R624	2007-000078	R-CHIP	1Kohm,5%,1/16W,DA,TP,1608	
R625	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R626	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R627	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R628	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R629	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R630	2007-000102	R-CHIP	100Kohm,5%,1/16W,DA,TP,1608	

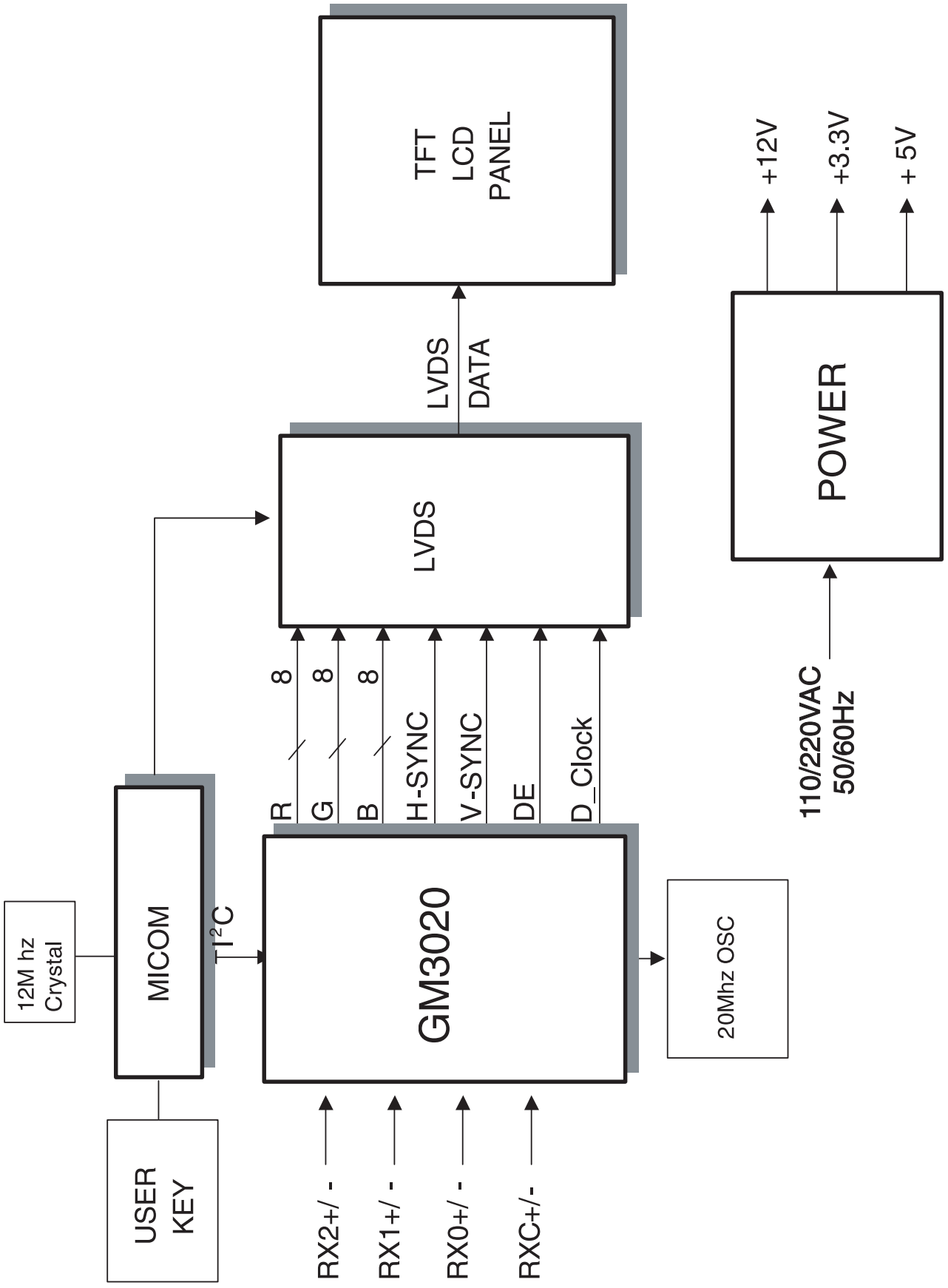
Loc. No.	Code No.	Description	Specification	Remarks
R631	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R632	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R633	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R634	2007-001002	R-CHIP	510ohm,5%,1/16W,DA,TP,1608	
R635	2007-001002	R-CHIP	510ohm,5%,1/16W,DA,TP,1608	
R636	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R637	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R638	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R639	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R640	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R641	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R642	2007-000078	R-CHIP	1Kohm,5%,1/16W,DA,TP,1608	
R866	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R867	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R868	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
RA301	2011-000002	R-NETWORK	22ohm,5%,63mW,L,CHIP,8P,TP	
RA302	2011-000002	R-NETWORK	22ohm,5%,63mW,L,CHIP,8P,TP	
RA303	2011-000002	R-NETWORK	22ohm,5%,63mW,L,CHIP,8P,TP	
RA304	2011-000002	R-NETWORK	22ohm,5%,63mW,L,CHIP,8P,TP	
RA305	2011-000002	R-NETWORK	22ohm,5%,63mW,L,CHIP,8P,TP	
RA306	2011-000002	R-NETWORK	22ohm,5%,63mW,L,CHIP,8P,TP	
X301	2801-004004	CRYSTAL-SMD	20.25MHz,20ppm,28-AAN,13pF,25ohm,TP	
X601	2801-003773	CRYSTAL-SMD	12MHZ,30PPM,28-AAN,20PF,50OHM,TP	
ZD201	0403-000579	DIODE-ZENER	BZX84C5V1,5.1V,5%,200mW,SOT-23	
ZD202	0403-000579	DIODE-ZENER	BZX84C5V1,5.1V,5%,200mW,SOT-23	
ZD203	0403-000579	DIODE-ZENER	BZX84C5V1,5.1V,5%,200mW,SOT-23	
ZD204	0403-000579	DIODE-ZENER	BZX84C5V1,5.1V,5%,200mW,SOT-23	
ZD205	0403-000579	DIODE-ZENER	BZX84C5V1,5.1V,5%,200mW,SOT-23	

6-2 Others

Loc. No.	Code No.	Description & Specification	Remarks
PANEL	BN07-00026A	LCD-DISPLAY;LTM150XH-L01,CZB,8BIT,333.6*254.76*12.5	
MAIN PCB ASS'Y	BN94-00128A	ASSY PCB-SN;GH15DS	
SIGNAL CABLE	BN39-00072A	CBF SIGNAL;DET,2000MM,24P/24P,IVORY,-,DVI	
INVERTER HARNESS	BN39-00020A	CBF-HARNESS;12P/12P,170MM,BLU/YEL/WHT	
LVDS HARNESS	BN39-00183A	LEAD CONNECTOR ASSY;UL2835#28,UL/CSA,20P,120MM	
POWER CORD(115V)	BN39-00141A	AC POWER CORD;125VAC,10A,1800,IVORY	
POWER CORD(230V)	BN39-00140A	AC POWER CORD;230VAC,250/10A,1.80M,3PIN EURO STRAIGH,IVORY	
INVERTER	BN44-00056A	INVERTER;GOGH,SIC1542,48KHZ,12VDC,37*140*16,4LAMP	

Memo

7 Block Diagram



Memo

8 Wiring Diagram

POWER PCB

MAIN PCB

CN2

1	+12V
2	+12V_INV
3	GND
4	GND
5	GND
6	PWR_OFF
7	3.3V

CN100

1	+12V
2	+12V_INV
3	GND
4	GND
5	GND
6	PWR_OFF
7	3.3V

CN101

1	2	3	4	5	6	7	8	9	10	11	12	
NC	BRT_CTL_INV	NC	BL_ON	NC	GND	+5V	GND	GND	+12V_INV	+12V_INV	+12V_INV	

CN402

1	2	3	4	5	6	7	8	9	10	
NC	GND	Tx3A+	Tx3A-	GND	TxCA+	TxCA-	GND	Tx2A+	Tx2A-	
11	12	13	14	15	16	17	18	19	20	
GND	Tx1A+	Tx1A-	GND	Tx0A+	Tx0A-	GND	GND	LCD_VCC	LCD_VCC	

CN600

1	+3.3V
2	KEY_A
3	LED_R
4	KEY_B
5	LED_G
6	GND

CN201

1	2	3	4	5	6	7	8	9	10	11	12	
Rx2–	Rx2+	GND	NC	NC	DVI_CLK	DVI_DTA	NC	Rx1–	Rx1+	GND	NC	
13	14	15	14	17	18	19	20	21	22	23	24	
NC	DVI_+5V	DVI_GND	DVI_+5V	Rx0–	Rx0+	GND	NC	NC	GND	RxC+	RxC–	

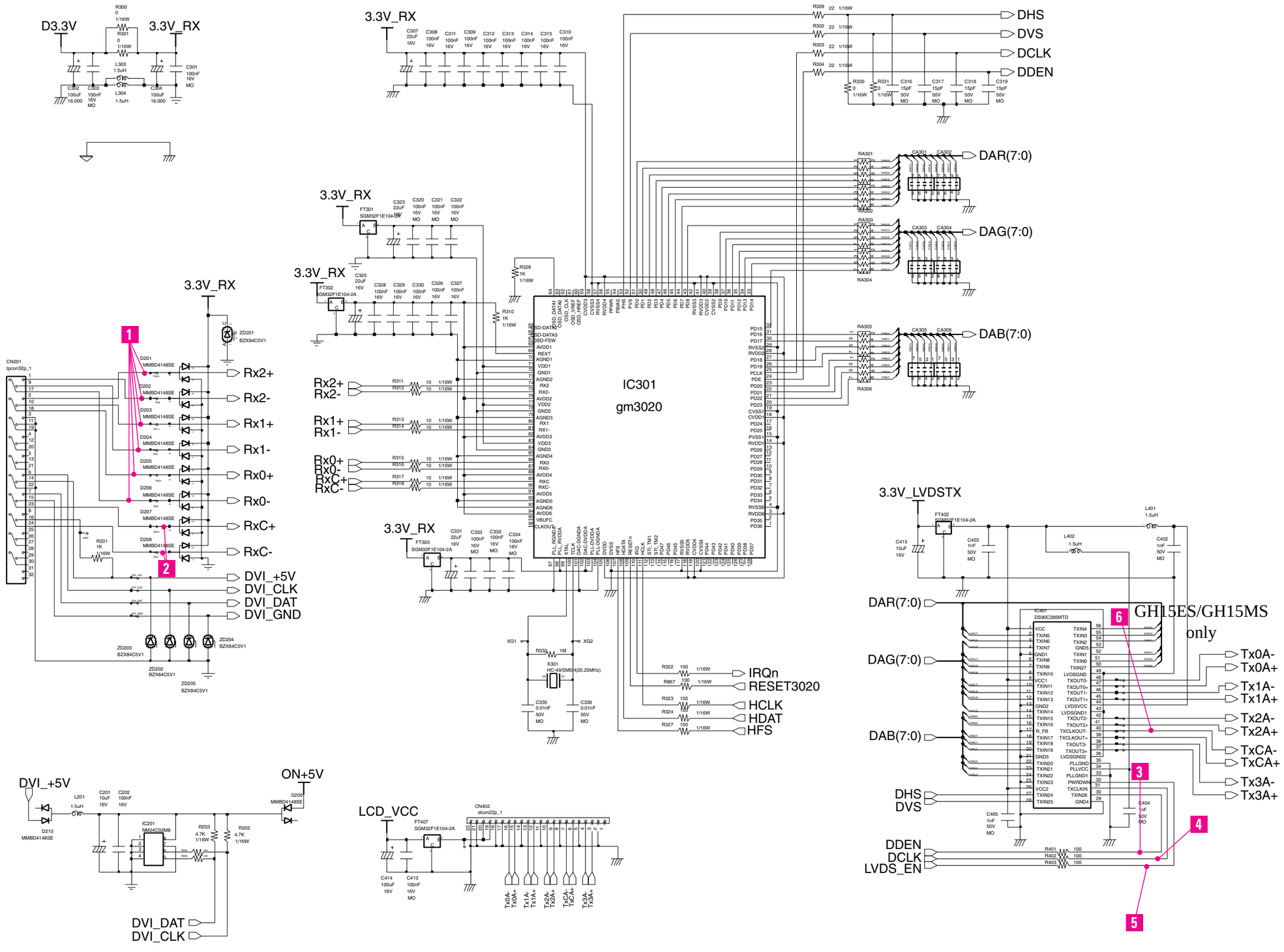
CN1

1	2	3
	GND	

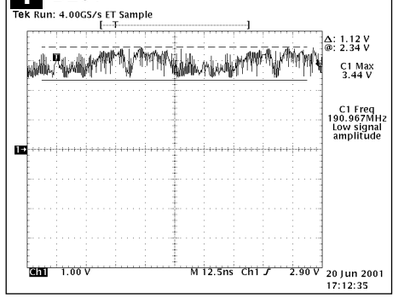
Memo

9 Schematic Diagrams

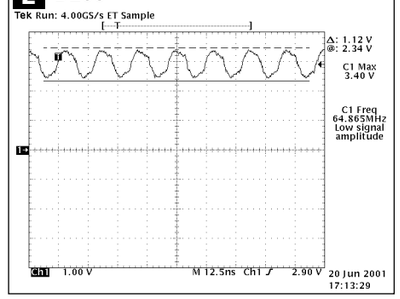
9-1 Main Part Schematic diagram



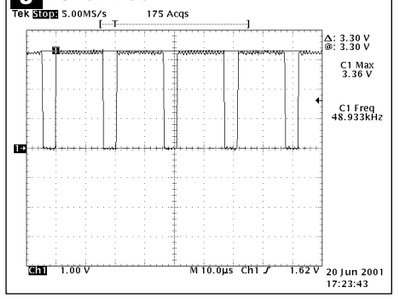
1 D201



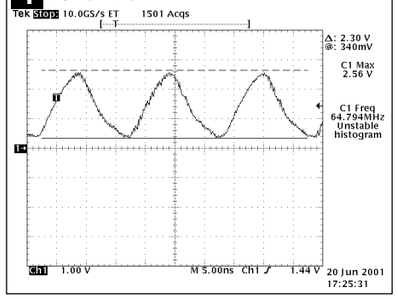
2 D208



3 IC401 #30



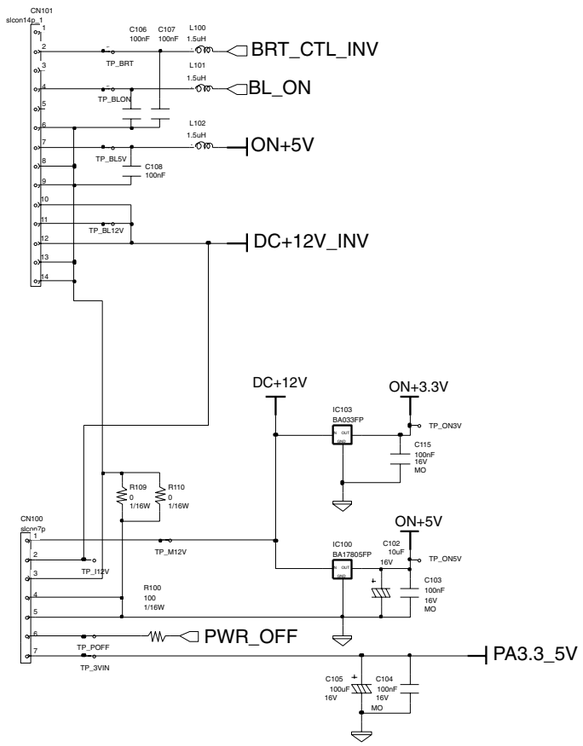
4 IC401 #31

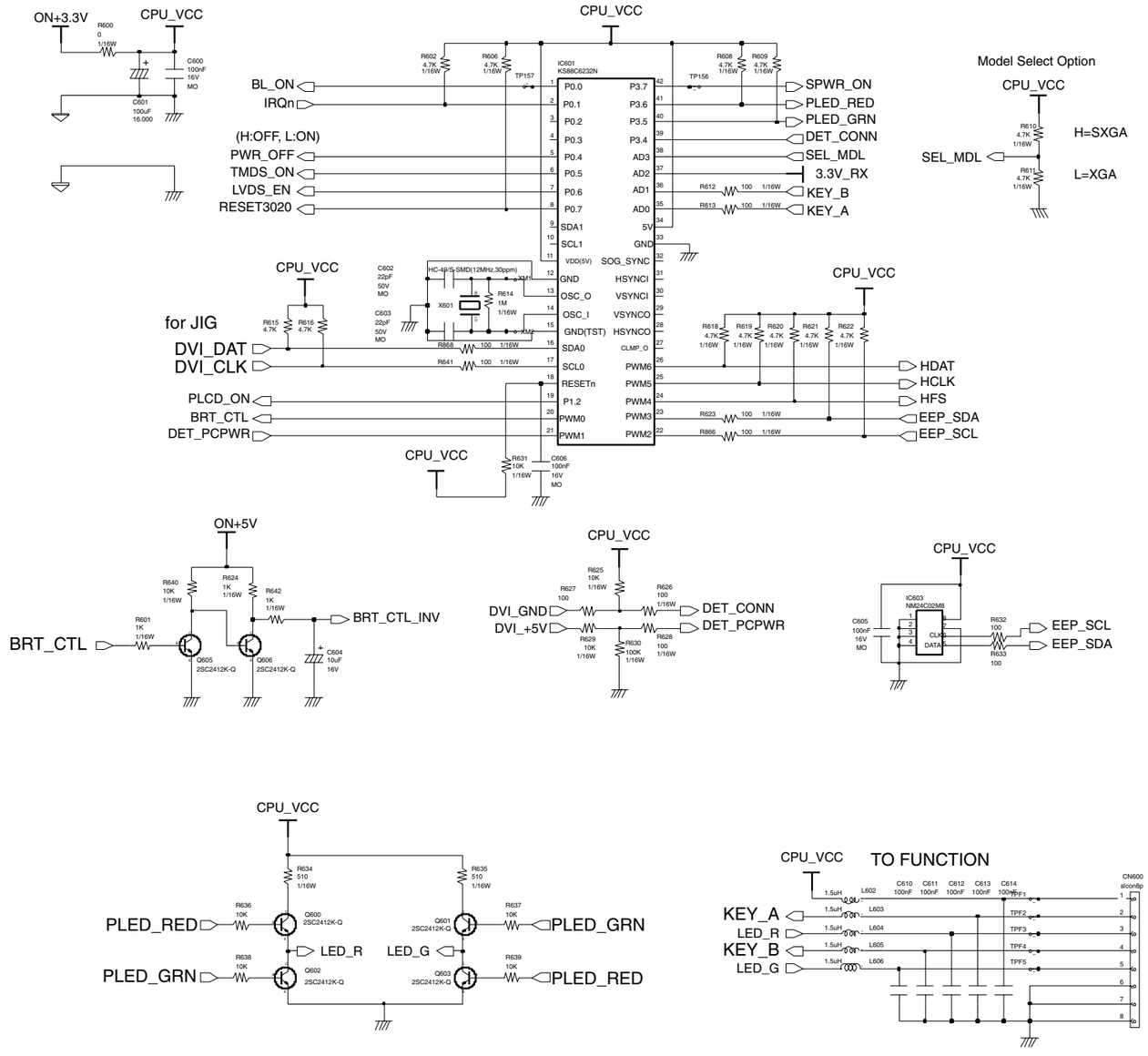


5 IC401 #32

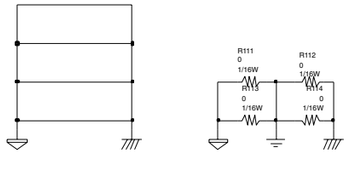
6 IC401 #40

9-2 Video Part Schematic diagram





Place at distributed position



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